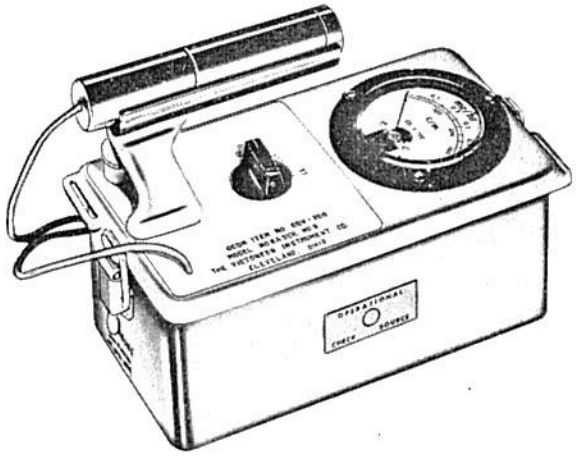
section 3

CDV-700-6&6A



specifications:

- Ranges: 0-0.5, 0-5, 0-50 mr/hr
- Sensing Element: Geiger Tube
- Accuracy: ±15% of true dose rate from cobalt 60 or cesium 137 gamma radiation
- Batteries: Four 1-1/2 volt NEDA 13
- Dimensions: approx. 8-3/4" long x 4-1/2" wide x 6-3/4" high including handle
- Weight: approx. 4 lbs. including batteries

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GENERAL DESCRIPTION

Introduction

The Victoreen CD V-700 models 6 and 6A are portable geiger counter instruments designed for the detection of low levels of beta and gamma radiation. The two instruments may be considered identical for the purposes of repair and maintenance.

The geiger tube is mounted in a probe on the end of a thirty-six inch cable. The entire instrument and its accessories include a circuit box, a probe, a headphone, an indicating meter, and a carrying strap. A radioactive sample is mounted on the side of the case for checking the operation of the instrument.

Sensing Indicators and Control

A meter with a scale reading in milliroentgens per hour (mR/hr) is used for visual indication, and a headphone is used for aural monitoring. The meter is ruggedized and sealed in a plastic case to meet the instrument requirements for water-tightness, shock and vibration resistance.

The meter is controlled by the range selector switch labeled "OFF,X100, X10, and X1". The range switch changes only the meter ranges. It does not affect the number of "clicks" in the headphone.

Readings

Table 3-1 lists switch positions and the corresponding meter readings. Figure 3-1 shows the meter face. Readings should not be taken with the pointer indicating in the lower 10% of the scale. Turn to the next most sensitive range until the pointer indicates in the upper 90% of the scale.

Switch Position	Counts/Minute	mR/hr
X1	0-300	0-0.5
X10	0-3000	0-5.0
X100	0-30,000	0-50

Table 3-1. Switch Positions vs Meter Readings

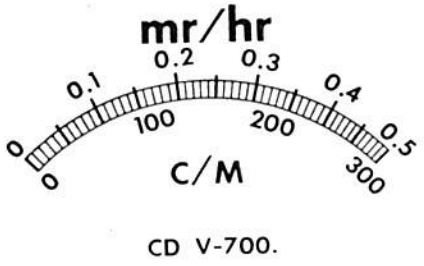


Figure 3-1. Meter Face

Initial Check

With the batteries installed, turn the range switch to the X10 position. Close the beta window of the probe. After thirty seconds the circuit should be stabilized and the meter should read zero in the absence of radiation.

Open the beta window on the probe and place the open window on the center of the OPERATIONAL CHECK SOURCE on the side of the instrument. The meter reading should average between 1.5 and 2.5 mR/hr.

Background Count

Normal background radioactivity is about 0.01 to 0.02 mR/hr or about 20

counts per minute. Counts are randomly spaced and several seconds may elapse before any activity registers on either the meter or the headphone. Accurate measurements of background and other low level radiation can be made by counting the headphone "clicks" against a watch that has a second hand. Note the number of counts occurring in a time period of 5 minutes. Divide the number of counts by 5 and the background count is expressed in terms of counts per minute. More accurate measurements may be made by extending the time period.

Batteries

The CD V-700-6 and 6A are powered by four 1-1/2 volt "D" size flashlight batteries. The batteries will operate the instruments continuously for over 100 hours and intermittently for over 175 hours. Refer to Appendix A for acceptable types and makes of batteries.

Installation (See figure 3-2)

Open the instrument by lifting the pull catch at each end of the case and separating the two halves to expose the battery compartments and the battery

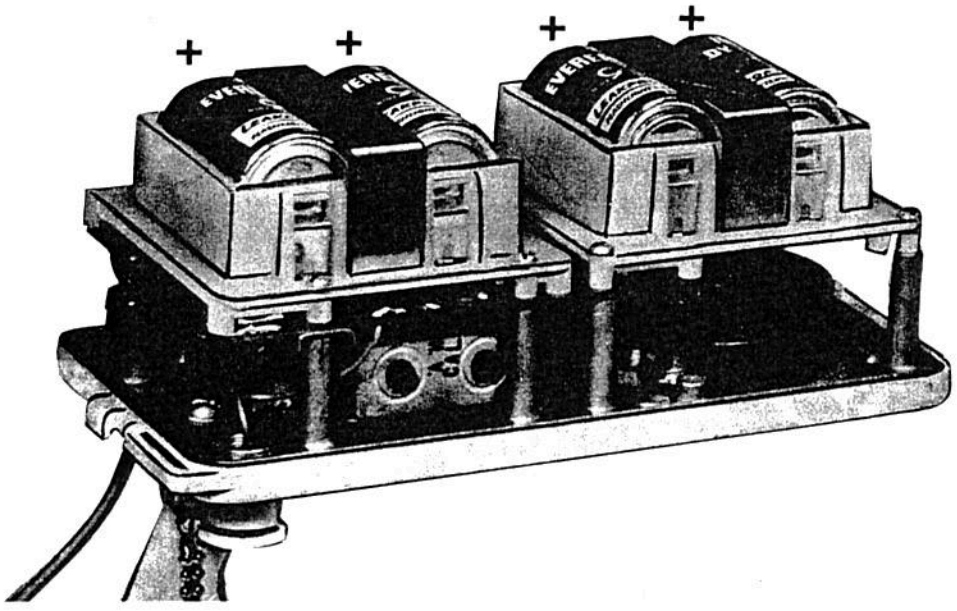


Figure 3-2. Battery Installation

retaining clips. Remove the clips by squeezing the ends and lifting. Insert fresh batteries according to the polarity marked on the inside of the battery compartments. The battery compartments will not accept batteries with the polarity reversed. Install the battery clips and close the case by aligning the two halves and closing the pull catches.

Replacement

If the instrument fails to operate, check the batteries before attempting to make any repairs or adjustments. A battery tester may be used or the batteries may be checked under load with a voltmeter while installed in the instrument. With the range switch in the X100 position, the batteries in the front battery compartment should measure at least 1 volt each. In the rear compartment, each battery should measure at least 1.25 volts. It is recommended that all the batteries be replaced at one time to avoid exceeding the shelf life of any one cell.

Electronic Circuitry

All electrical components which make up the circuitry are fastened to a printed circuit board. The circuitry serves to count the geiger tube pulses and to indicate their frequency in terms of dose rate on a calibrated scale.

High Voltage Power Supply

The high voltage supply needed by the geiger tube is a blocking oscillator driven "fly-back" circuit. The blocking oscillator portion of the circuit consists of Q2, R7B, transformer windings 3-4 and 5-6, and batteries BT1 and BT2. When the instrument is turned on, Q2 conducts and an increasing current flows through transformer winding 3-4. The increasing collector current induces a voltage in transformer winding 5-6 which maintains conduction of Q2. The collector current increases until Q2 has sufficient current gain to remain saturated when the circuit rapidly turns off due to the regenerative action of the transformer. During the "turn-off" action, large "fly-back" voltages appear across all transformer windings. A peak voltage of about 1100 volts appears across winding 1-2 because of the large number of turns of wire in the winding. This voltage "fly-back" is rectified by CR5 in a conventional

manner. R12 and C4 filter and smooth the pulsations of voltage across C5. V2 is a corona-discharge regulator tube which maintains the voltage at the proper level for operation of the geiger tube.

Pulse Shaping Circuit

The pulse shaping circuit is a blocking oscillator similar to the power supply, but with some exceptions. The circuit is held "cut-off" by the bias formed by resistors R9 and R10 and the power supply batteries. The blocking oscillator consists of Q1, T1, L1, C1, and CR1. C1 couples negative pulses from the geiger tube to the base circuit of Q1. Inductance L1 forms a high impedance for the geiger tube pulses while it is a low resistance to direct current. CR1 prevents oscillations from occurring across L1. When Q1 is turned on by a pulse from the geiger tube, Q1 saturates and nearly all of the battery voltage of BT3 and BT4 appears across the transformer winding 3-4. As the current increases in winding 3-4, a voltage is induced in winding 1-2. The induced voltage is in such a direction that conduction of Q1 is maintained. The current in transformer winding 3-4 increases linearly until the transformer core saturates. At this time the circuit rapidly turns off, and an inductive "fly-back" voltage appears across both windings.

Metering Circuit

The "fly-back" pulse induced in transformer winding 3-4 is rectified by diode CR2. The range multiplier resistors R1, R2, R3, and R4 determine the amount of charge that is placed on integrating capacitor C2 during the pulse period of the blocking oscillator. The capacitor is discharged by the meter and resistor R5. Resistors R6 and R7A are used for calibration.

Audio Circuit

The pulse for the headphone is taken from the "fly-back" of transformer winding 3-4 through diode CR3. C3 is an integrating capacitor used to stretch the pulse. R8 provides isolation and CR4 damps ringing in the headphone.

SERVICING

Precautions

High Voltage Power Supply

The high voltage supply of the instrument operates in excess of 900 volts. The shock is uncomfortable rather than dangerous but should be avoided. The high voltage components should not be touched even when the instrument is turned off until the high voltage capacitors have been discharged. These capacitors are to be discharged by shorting the voltage regulator tube. Do not short the geiger tube leads since this causes component failure in some models.

Geiger Tube

Care must be exercised not to dent the geiger tube. Dents in the tube may cause arcing at voltages lower than the operating voltages and the tube will be useless. Dropping the tube may cause leakage of the gas mixture.

Semi-Conductor Components
(Diodes and Transistors)

The diodes and transistors used in the instrument may be damaged by prolonged heating during soldering. When replacing any of these components, the soldering operation should be done quickly. Hold the lead between the com-

ponent and the joint with a heat sink to decrease the amount of heat transmitted to the component. Techniques are described in section 1 of this Manual. The leads of the high voltage rectifier may break if subjected to strain when removing the component from the circuit board. Use a soldering aid to lift the leads.

Disassembly Instructions

1. Open the pull catches at the ends of the case and remove the instrument from the case bottom.
2. Remove the batteries.
3. Remove the eight screws from the battery compartments. Note that the two screws at the rear of the circuit board are slightly longer than the others.
4. Remove the range switch knob from the front panel by loosening both set screws.
5. Disconnect the meter by removing the two nuts holding the connecting lugs.
6. Remove the circuit board from the case top by pressing on the range switch shaft. Remove the board slowly since the geiger tube lead and the headphone jack lead are still connected.
7. Reassembly is the reverse of the above process. On some models, the geiger probe shield is connected to the circuit board through a solder lug between the board and the nearest case top leg. This lug must be replaced during reassembly.

Preventive Maintenance

It is recommended that preventive maintenance be carried out once a month when the instrument is in use and once every six months when the instrument is in storage.

1. Remove the batteries, clean the battery contacts and battery terminals if necessary, and remove any corrosion present.
2. Replace the batteries making certain that all batteries exceed the minimum voltages.

3. Perform the Initial Check as described on page 3-2.
4. If the instrument is to be shipped or stored, remove the batteries and set the range switch to one of the sensing ranges. This will shunt the meter and minimize damage from movement of the pointer during shipment or storage.

Do not use solvents on plastic parts. Clean with soap and water. If the battery has leaked, remove the case bottom and wash it with warm soapy water. The battery spillage will be loosened in a short while and can be rinsed out.

Repairs

Adjusting the High Voltage Power Supply

The special high voltage adjustment on the CD V-700 models 6 and 6A permits greater instrument life by compensating for component aging. Whenever fresh batteries are installed in the instrument and the instrument still fails to operate, check the high voltage adjustment. The voltage at test point F should be checked with a high impedance voltmeter. (See Appendix B for procedure.) If the voltage is too low, adjust the high voltage oscillator as follows:

1. Connect a VOM or a 100 ma panel meter in series with the power supply batteries in the front battery box.
2. Turn the high voltage adjustment, R7A, fully clockwise.
3. Turn the range selector switch to X100.
4. Rotate the screwdriver adjustment counterclockwise until the meter reads 33 milliamperes, or until the high voltage output, as measured at point F, is correct.

Replacing the Geiger Tube

1. Grasp the two ends of the probe and twist in a counterclockwise direction to unscrew the tube housing from the socket housing.
2. Insert the new geiger tube into the socket pressing the tube into the socket and against the rubber gasket. Do not handle the thin beta window.

3. Place the tube housing over the geiger tube.
4. Engage the threads of the tube housing and socket housing with a steady pressure against the shock mounting spring and screw together in a clockwise direction. Overtightening may interfere with the operation of the beta shield.

Replacing the Voltage Regulator Tube

The VR tube is held to the circuit board with a rubber grommet and metal clip. To remove the tube, unsolder the leads and press on the top of the tube to lift the leads. Twist the tube while pulling it out of the protective grommet. Coat the top half of the new tube with a lubricant such as silicone grease and slide it into the grommet. Connect the cathode to ground and the anode (red dot) to point F. (See figure 3-5) Position the tube so that the leads will not short to the instrument case. Figure 3-3 shows a properly installed voltage regulator tube.

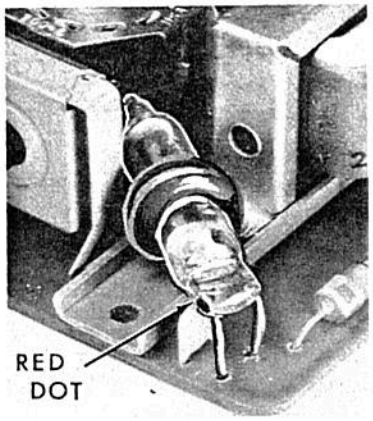


Figure 3-3. VR Tube Placement

Replacing Coil L1

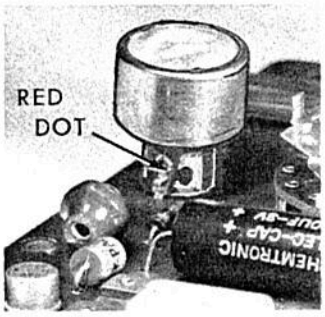


Figure 3-4
L1 Placement

L1 must be installed with the correct polarity for proper operation of the pulse shaping circuit. The red marking should face R4 and Q1. If a shielding ferrule was present on the old coil and is not present on the new one, the ferrule should be transferred to the new coil. Wrap the coil with a layer of masking tape. Glue the ferrule to the top of the coil with radio service cement, model airplane cement, or epoxy cement. Be careful not to cut through the coil winding. Figure 3-4 shows the proper mounting of L1.

Replacing Transformers

The transformers must be removed by drilling out the two eyelets holding them to the circuit board. To be sure that transformer replacement will cure the fault, unsolder the leads and substitute another transformer before removing the old one.

The laminations of the pulse transformer, T1, must be held together tightly for proper operation. Eyelets, bolts and nuts, or cotter pins may be used for mounting, but the laminations must be pressed tightly against the circuit board.

Replacing the Geiger Probe

1. Remove the rear battery compartment and unsolder the probe leads.
2. Remove the seal nut with an adjustable wrench.
3. Untie the knot, remove the solder lug if present, and pull the cable through the hole in the case top.
4. Prepare the new cable according to the instructions in section 1 of this Manual.
5. Twist the center conductor and shield together to allow the wires to be inserted through the case top. Pull on the end of the cable with pliers until a sufficient amount extends through the case top.
6. Replace the seal nut and washers on the new cable and tighten the seal nut using moderate pressure. Excessive tightening can damage the cable. Tie a knot in the cable near the seal nut.
7. Connect the cable to the circuit board and replace the battery compartment. The ground lead is soldered to a lug under the nearest case top leg on some models. On newer units, a lug under the handle mounting screw is the ground connection.

Replacing the Switch

1. Follow the Disassembly Instructions through step 6.
2. Heat each switch terminal on the circuit board, one at a time, and press sideways on the switch shaft. This will tend to lift the terminals from the circuit board. Repeat this procedure several times, pushing away from the solder joint each time, until the switch is free.

3. Open the holes on the circuit board with a soldering pencil and soldering aid to allow the switch terminals to be inserted.
4. Insert the new switch and solder each terminal using a minimum amount of heat. Be sure the switch is seated properly so that the shaft will fit through the hole in the case top.

Trouble Shooting

The information in this section is presented as an aid to the service technician in determining the causes of specific instrument faults. The Trouble Shooting Guide lists the most probable causes of instrument failure together with suggestions for corrective action. This should be consulted and followed after the following preliminary steps have been taken:

1. Disassemble the instrument through step 3 of the Disassembly Instructions.
2. Check all batteries. Make sure they provide sufficient voltage for proper operation of the instrument.
3. Check the printed circuit board for broken foil, cold solder joints, or solder bridges.
4. Check for broken components.

Table 3-2, Test Point Chart, and figure 3-5, Location of Test Points, eliminate the need for circuit tracing when making voltage and resistance measurements. The Test Points are referred to in the NOTES column of the Trouble Shooting Guide, and are also found on the schematic circuit diagram.

TROUBLE SHOOTING GUIDE

SYMPTOM		PROBABLE CAUSE	CORRECTIVE ACTION	NOTES
Meter	Headphone			
Dead	Dead	Batteries low or making poor contact	Check batteries and contacts	
		High voltage power supply not properly adjusted	Adjust R7B	Voltage at F low
		Geiger tube defective or not compatible with instrument's high voltage	Replace geiger tube or correct instrument's high voltage	Check starting voltage of tube. This must be lower than voltage at point F
		Probe shield shorting to high voltage supply	Dress leads	Voltage at F=0. CR1 may be damaged
		Geiger probe defective	Repair or replace probe	CR1 may be damaged
		CR1 shorted	Replace CR1	Check geiger probe and C1 for shorts before replacing CR1
		Q2 defective	Replace Q2	Voltage at F=0. Check Q2 for beta and shorts

SYMPTOM		PROBABLE CAUSE	CORRECTIVE ACTION	NOTES
Meter	Headphone			
Dead (cont'd)	Dead (cont'd)	T2 defective	Repair or replace T2	Check resistance at D - K, E - K, G - ▲
		Q1 defective	Replace Q1	
		T1 defective	Repair or replace T1	Check resistance at B - ▲, M - N
		CR2 shorted	Replace CR2	
		CR3 shorted	Replace CR3	
		CR5 defective	Replace CR5	Voltage at F low
		C1 open	Replace C1	Voltages normal. Check by tapping with screwdrive at probe pin 1 and at point N
		C1 shorted	Replace C1	Voltage at F low. CR1 may be damaged
		C4 shorted	Replace C4	Voltage at F=0
		C5 shorted	Replace C5	Voltage at F=0
		C5 open	Replace C5	Voltage at F low

Dead	Normal	Meter defective	Repair or replace meter	
		CR2 open	Replace CR2	
		Open contact on S1A	Repair switch	Check resistance at A - ▲
		C2 defective	Replace C2	
Normal	Dead or Weak	Poor connection in headphone plug or jack	Repair connection	
		Headphone defective	Repair or replace headphone	
		CR3 open	Replace CR3	
		CR4 shorted	Replace CR4	
		C3 shorted	Replace C3	
Upscale	Dead	BT2 lead shorting to lug on R7A	Dress leads	
		Q1 defective	Replace Q1	Voltage at H low. Check Q1 for shorts
Upscale	Squeal or Buzz	CR1 open	Replace CR1	Voltage at H high
		L1 open	Repair or replace L1	
		CR4 open	Replace CR4	
		CR3 defective	Replace CR3	

SYMPTOM		PROBABLE CAUSE	CORRECTIVE ACTION	NOTES
Meter	Headphone			
Upscale (cont'd)	Squeal or Buzz (cont'd)	L1 needs shield	Install no. 700-116 ferrule	See figure 3-4
		L1 reversed	Reposition L1	Red marking should face R4 and Q1. See figure 3-4
		T2 defective	Replace T2	
		C5 open	Replace C5	Check voltage at F. Symptoms may cease when voltmeter is connected
Upscale	Hiss or Click	Probe shield shorting to high voltage supply	Dress leads	Voltage at F low or intermittent. CR1 may be damaged
		Geiger probe defective	Repair or replace geiger probe	Voltage at F low or intermittent. CR1 may be damaged
		Geiger tube defective	Replace geiger tube	
		V2 defective or not making contact to circuit board	Replace or resolder V2	Voltage at F high
		T2 defective	Repair or replace T2	Voltage at F low or intermittent

Erratic	Normal	C2 open	Replace C2	
		Meter defective	Repair or replace meter	
High or Low	Normal	Calibration disturbed	Recalibrate	
		Geiger tube defective or not compatible with instrument's high voltage	Replace geiger tube or correct instrument's high voltage	
		Meter defective	Replace meter	
		CR1 defective	Replace CR1	
		CR2 defective	Replace CR2	
		Q1 beta high or low	Replace with transistor having proper gain	
		V2 defective	Replace V2	Check voltage at F
		CR5 defective	Replace CR5	Voltage at F low
		C2 defective	Replace C2	
		C4 defective	Replace C4	Voltage at F low
		C5 defective	Replace C5	Voltage at F low
		Open contact on S1A	Repair switch	Check resistance at A - ▲

RESISTANCE CHART

Remove batteries before checking resistances. Values ±20% except as noted.

Component	Points	Range Switch Position	Resistance (ohms)
S1A and calibration resistors	A - ▲	X100 X100 X1	1900 ±5% 200 ±5% 16.5 ±5%
S1B	C - L	All except OFF	0
S1C	J - ▲	All except OFF	0
T1	M - N B - ▲	Any Any	2 2
T2	D - K E - K G - ▲	Any Any Any	5 11 4500

VOLTAGE CHART

Voltages measured with respect to point ▲. Use a 20,000 ohms per volt meter. All values ±20%.

Point	Voltage	Voltmeter Range
F	920	*
C	6.0	10
H	3.2	10
K	3.0	10

*Use a high impedance voltmeter. See Appendix B.

Table 3-2. Test Point Chart

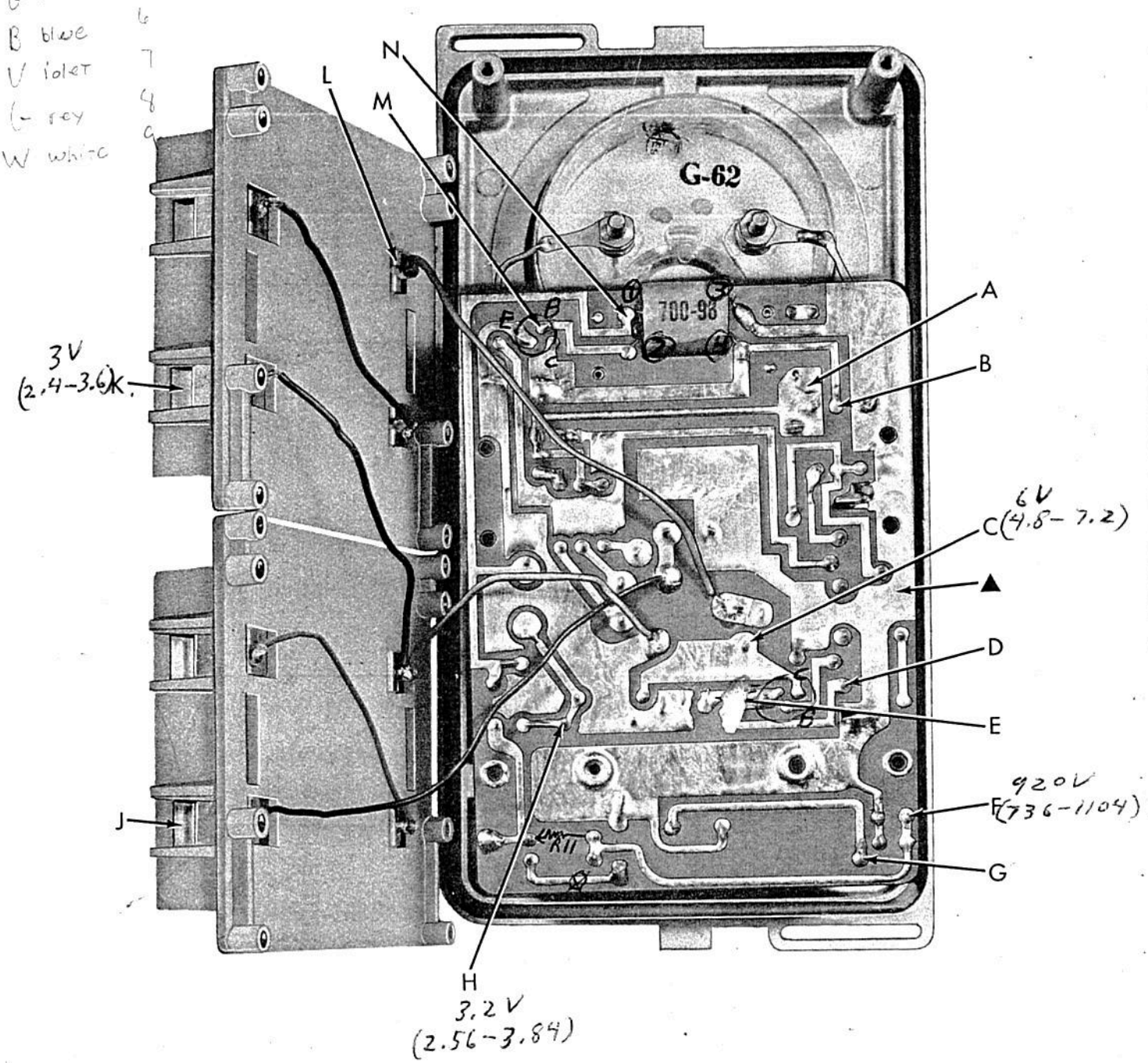
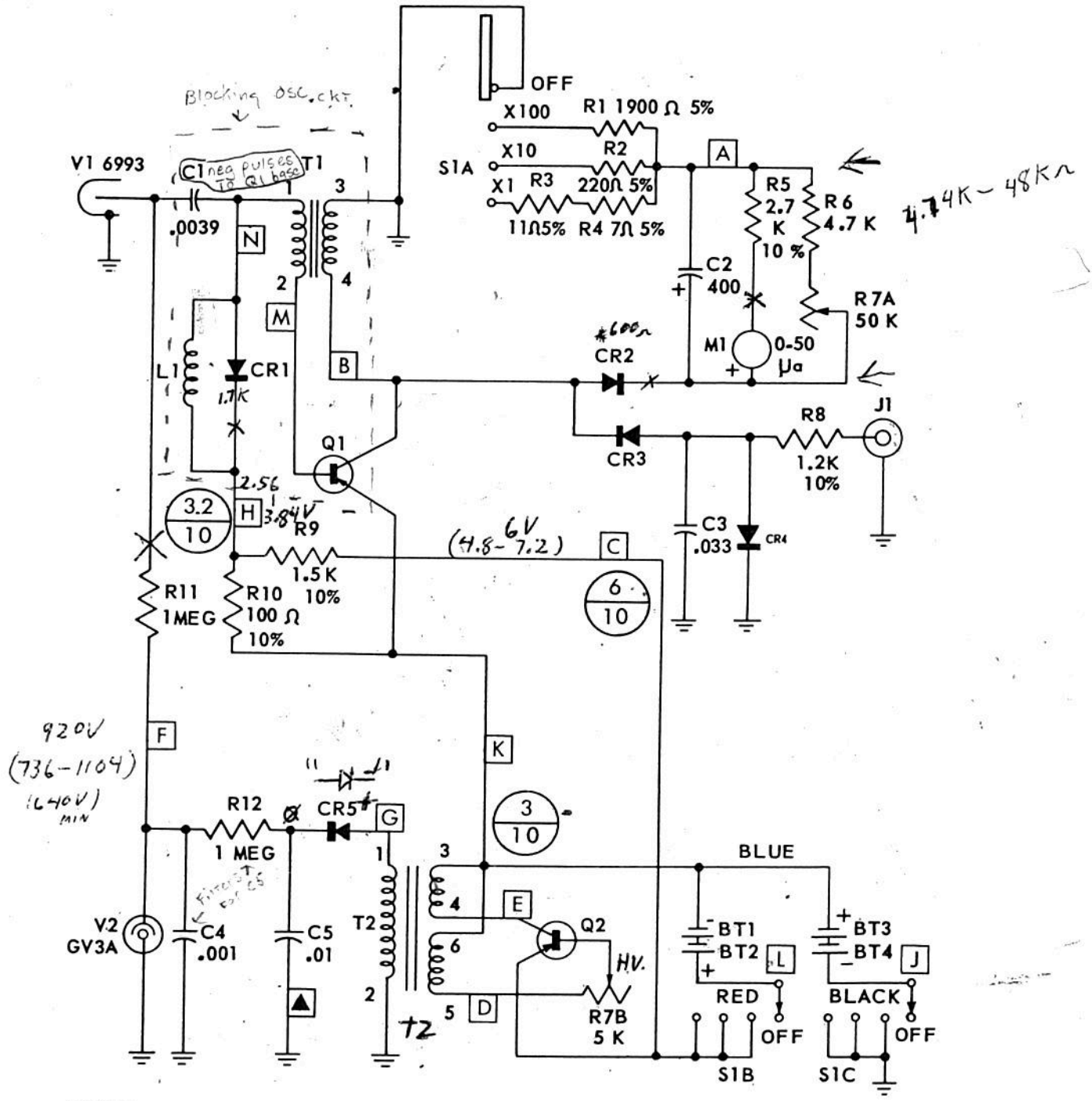


Figure 3-5. Location of Test Points



NOTES:

All capacitance values in microfarads

Resistors 1/2W 20% except as noted

[A] indicates Test Points

Voltages measured on a 20,000 ohms per volt meter with respect to point ▲

Figure 3-6. Schematic Circuit Diagram

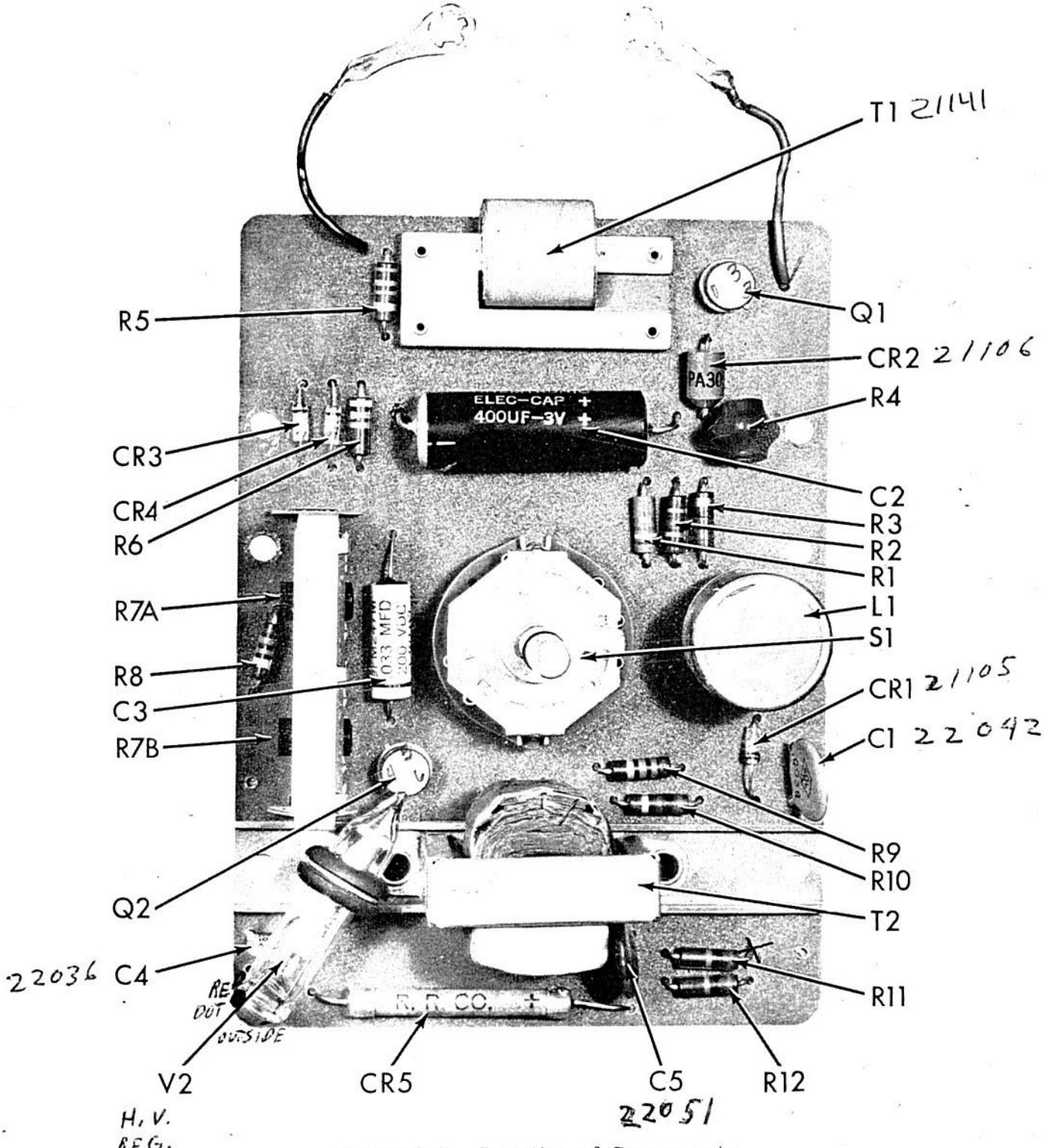


Figure 3-7. Location of Components

PARTS LIST pg III-7 & III-43

Electrical Components

Circuit Symbol	Description	Function	Manufacturer & Part No.	Victoreen Part No.
BT1	Battery "D" size 1.5V NEDA 13	Power supply battery	Union Carbide 950	16-4
BT2	Battery "D" size 1.5V NEDA 13	Power supply battery	Union Carbide 950	16-4
BT3	Battery "D" size 1.5V NEDA 13	Ratemeter battery	Union Carbide 950	16-4
BT4	Battery "D" size 1.5V NEDA 13	Ratemeter battery	Union Carbide 950	16-4
C1	Capacitor 0.0039 ufd 1000V	Coupling capacitor	Centralab DA 048 249 CB	21-193 22042
C2	Capacitor 400 ufd 3V	Integrating capacitor	Chemtronic Corp. 20-437BP 400-3D65	21-87 22077
C3	Capacitor 0.033 ufd 75V	Headphone pulse stretcher	John E. Fast Co. 4-21365-3	21-194 22054
C4	Capacitor 0.001 ufd 1000V	By-pass capacitor	Radio Materials Corp. B.001 Discap	21-43 22036
C5	Capacitor 0.01 ufd 1600V	By-pass capacitor	Good-All Electric Mfg. Co. H1-KB	21-23 22051

Circuit Symbol	Description	Function	Manufacturer & Part No.	Victoreen Part No.	Victoreen
CR1	Diode, germanium	Damper	CBS Electronics Sales Corp. 1N-34	52-1	21105
CR2	Diode, silicon	Meter rectifier	Radio Receptor Co. Inc. PA-305A	52-35	21106
CR3	Diode, germanium	Headphone pulse stretcher	CBS Electronics Sales Corp. 1N-34	52-1	21105
CR4	Diode, germanium	Damper	CBS Electronics Sales Corp. 1N-34	52-1	21105
CR5	Rectifier, selenium	High voltage rectifier	International Rectifier Corp. T35HP	489-17	21132
H	Headphone 4K ohms at 1 kc	Aural indicator	Superex Electronics, Inc.	700-16	
J1	Phone jack assembly	Headphone connector	Victoreen Instrument Co. 700-102	700-102	
L1	Choke 8.2 mh	Geiger tube load	J. W. Miller Co. 981	700-99	21101
M1	Meter assembly 0—50 ua	Visual indicator	Victoreen Instrument Co. 700-95	700-95	
Q1	Transistor, PNP	Ratemeter transistor	Victoreen Instrument Co. 23-17	23-17	21143
Q2	Transistor, PNP	Power supply transistor	Victoreen Instrument Co. 23-6	23-6	21142

Circuit Symbol	Description	Function	Manufacturer & Part No.	Victoreen Part No.
R1	Resistor 1900 ohms 1/2W 5%	X100 range multiplier	Victoreen Instrument Co. 185-1412	185-1412
R2	Resistor 220 ohms 1/2W 5%	X10 range multiplier	International Resistance Co. 50-65	185-560
R3	Resistor 11 ohms 1/2W 5%	1/2 of X1 range multiplier	International Resistance Co. 50-65	185-429
R4	Resistor 7 ohms Wire wound 5%	1/2 of X1 range multiplier	Victoreen Instrument Co. 185-1411	185-1411
R5	Resistor 2.7K ohms 1/2W 10%	Meter time constant	International Resistance Co. 50-65	185-252
R6	Resistor 4.7K ohms 1/2W 20%	Part of calibration resistance	International Resistance Co. 50-65	185-1303
R7	Potentiometer 50K ohms 5K ohms		Stackpole Carbon Co. DVV5K25K	22-6 21125
R7A	Section of R7 50K ohms	Calibration control	———	——— 21125
R7B	Section of R7 5K ohms	Power supply adjust	———	———
R8	Resistor 1.2K ohms 1/2W 10%	Headphone decoupler	International Resistance Co. 50-65	185-633
R9	Resistor 1.5K ohms 1/2W 10%	1/2 of Ratemeter Bias	International Resistance Co. 50-65	185-351

Circuit Symbol	Description	Function	Manufacturer & Part No.	Victoreen Part No.	
R10	Resistor 100 ohms 1/2W 10%	1/2 of ratemeter bias	International Resistance Co. 50-65	185-118	
R11	Resistor 1 meg 1/2W 20%	Geiger tube load	International Resistance Co. 50-65	185-1305	
R12	Resistor 1 meg 1/2W 20%	Filter	International ResistanceCo. 50-65	185-1305	
S1	Switch	Range switch	Victoreen Instrument Co. 700-6	700-6	21138
S1A	Section of S1	Range multiplier selector	———	———	
S1B	Section of S1	Power supply battery switch	———	———	
S1C	Section of S1	Ratemeter battery switch	———	———	
T1	Transformer assembly	Pulse transformer	Victoreen Instrument Co. 700-98	700-98	21140
T2	Transformer	Power supply transformer	Victoreen Instrument Co. 14-32	14-32	21141
V1	Geiger tube 6993	Detecting element	Victoreen Instrument Co. CPO 352	CPO-352	22156
V2	Voltage regulator tube GV3A—900V	Regulates high voltage	Victoreen Instrument Co. CPO 240	CPO-240	22151

Mechanical Components

Description	Function	Manufacturer & Part No.	Victoreen Part No.
Battery compartment (2)	Houses batteries	Victoreen Instrument Co. 700-66	700-66
Battery contact (8)	Electrical connections to batteries	Victoreen Instrument Co. 700-68	700-68
Battery retainer clip (2)	Holds batteries in battery box	Victoreen Instrument Co. 720-121	720-121
Cap plug and chain assembly	Covers phone jack	Victoreen Instrument Co. 700-65	700-65
Case bottom and clamp assembly	Bottom case of instrument	Victoreen Instrument Co. 700-101	700-101
Case gasket	Water seal between case top and bottom	Victoreen Instrument Co. 720-157	720-157
Case top	Top panel of instrument	Victoreen Instrument Co. 700-59	700-59
Detent ball	Positions sliding probe shield	New Departure Div. GMC 1/16" ball 44055 Gr 2	700-89
Detent spring	Holds detent ball in place	Victoreen Instrument Co. 700-85	700-85
End cap	End cap of probe	Victoreen Instrument Co. 700-78	700-78

Description	Function	Manufacturer & Part No.	Victoreen Part No.
Gasket	Seals probe	Victoreen Instrument Co. 700-79	700-79
Grommet	Holds voltage regulator tube	Philpott Rubber Co. GB-225	373-75
Instruction manual (2)	Operating instructions	Victoreen Instrument Co. 700-108	700-108
Knob	Range switch knob	Harry Davies Molding Co. 1500K	710-85
Meter gasket	Water seal between case top and meter	Victoreen Instrument Co. 700-63	700-63
"O" ring	Seals phone jack	Parker Appliance Co. 2-12	46-47
"O" ring	Seals probe stand	Parker Appliance Co. 2-9	46-25
"O" ring	Switch shaft water seal	Parker Appliance Co. 5427-1	46-38
Phone plug	Headphone connection	Switchcraft 2501F	700-57
Probe assembly	Holds geiger tube	Victoreen Instrument Co. 700-75	700-75
Probe clip	Holds probe to case handle	Victoreen Instrument Co. 700-61	700-61

Description	Function	Manufacturer & Part No.	Victoreen Part No.
Probe shield retaining spring	Holds probe shield in place	Victoreen Instrument Co. 700-87	700-87
Probe stand handle	Instrument carrying handle; holds probe clip	Victoreen Instrument Co. 700-73	700-73
Rubber gland	Seals probe cable	Victoreen Instrument Co. 700-71	700-71
Seal nut	Clamps probe cable	Victoreen Instrument Co. 700-72	700-72
Shoulder strap	Carrying strap	Victoreen Instrument Co. 700-81	700-81
Strap buckles (2)	Carrying strap length adjustment	Waterbury Buckle Co. 807 5047	710-44
Strap fasteners (2)	Attaches shoulder strap to instrument	Victoreen Instrument Co. 700-82	700-82
Transformer bracket	Supports power supply transformer	Victoreen Instrument Co. 700-96	700-96 21094
Tube clip	Holds voltage regulator tube to circuit board	Victoreen Instrument Co. 700-94	700-94